

Whipple Cast and Wrought Iron Bowstring

HAER No. NY-4

Truss Bridge

Spanning a ravine 250' north of Normans Kill  
and 965' west of Delaware Avenue

Normanskill Farm

North of Normansville, within city limits of  
Albany, Albany County,  
New York

HAER  
NY-4-ALB,  
19-

PHOTOGRAPHS  
WRITTEN HISTORICAL AND DESCRIPTIVE DATA  
REDUCED COPIES OF MEASURED DRAWINGS

Historic American Engineering Record  
Office of Archeology and Historic Preservation  
National Park Service  
U.S. Department of the Interior  
Washington, D.C. 20240

HISTORIC AMERICAN ENGINEERING RECORD

WHIPPLE CAST AND WROUGHT IRON BOWSTRING TRUSS BRIDGE  
HAER No. NY-4

Location: Spanning a ravine 250' north of Normans Kill  
and 965' west of Delaware Avenue  
Normanskill Farm  
North of Normansville, within city limits of  
Albany, Albany County, New York  
Latitude: 42° 38' 00" N. Longitude: 73° 48' 00" W.

Date of Erection: Fabricated in 1867 (cast into top-chord members)  
and originally erected at another site; moved and  
re-erected at Normansville site c. 1900.

Designer: Squire Whipple, C.E. (1804-1888)

Present Owner: Mark Stevens, Normanskill Farm, Albany, New York

Present Use: Vehicular bridge, trucks and busses restricted

Significance: One of only two known surviving "Whipple" bowstring  
truss bridges, and one of the few remaining composite  
cast- and wrought-iron bridges, this span was built  
according to the patented design of Squire Whipple,  
which was used widely during the second half of the  
nineteenth century mainly in New York State. When  
Whipple's patent of 1841 expired in 1869, the design  
was copied down to the last detail by a number of  
builders, such as DeGraff, who were glad to avoid  
royalties.

PART I. HISTORICAL INFORMATION

A. Physical History:

1. Original builder: Simon DeGraff, after basic pattern of Squire Whipple.
2. Original plan and construction: This bridge is a fine example of Whipple's Patent Iron Arch Truss Bridge, or the Whipple Bowstring Truss, invented in 1841 by Squire Whipple. It was fabricated by Simon DeGraff of Syracuse, New York, whose name with the date 1867, is cast into several iron parts.
3. Alterations: Beyond the moving of the bridge itself from another site, there are no apparent alterations except the occasional maintenance replacement of the wood deck.

4. History at present location: Normansville, once known as Upper Hollow, is a hamlet located approximately two miles west of downtown Albany, N.Y. It is situated in a deep ravine formed by the Normans Kill, which once provided water power for saw mills, woolen mills, and a paper factory.

The old Albany & Delaware Turnpike crossed the kill at that point, first with a wooden bridge, and in 1869 by means of an early two-span iron structure built by the Town of Bethlehem.

In 1866 Upper Hollow had seven dwellings, and since nothing is indicated on a map of that year, it is assumed that the present Normanskill Farm was established subsequent to that date. The original access to the farm was by means of the steep road up the bank of the Normans Kill to the west of the village.

In 1899 plans were made to relocate the Albany & Delaware Turnpike (Delaware Avenue) to the north of the original route. It would descend to Normansville by an easier grade along the contours of a hill adjacent to another ravine made by a tiny, unnamed tributary of the Normans Kill. On a map of that year no bridge is shown, and the property was owned by an Amanda M. Lightbody.

After the new, yellow bricked route of Delaware Avenue was constructed, it was obvious that an easier entrance to the Normanskill Farm could be made by bridging the ravine at the eastern edge of the property.

The owners of the farm acquired a 113-foot Whipple Bowstring Iron Truss Bridge which would more than adequately span the ravine. The bridge, a second-hand structure, is reported to have been brought "from Schoharie."

"From Schoharie" could refer to the county of Schoharie, the village of Schoharie, or the valley of Schoharie Creek. The Schoharie area is about 25 miles west of the site. If the bridge originally stood there it was undoubtedly dismantled and moved in sections over the old route of the Delaware Turnpike to Normansville, where it was carefully re-erected on suitable stone and concrete abutments previously prepared to receive it. Indeed, one of the happiest features of the bolted and pinned form of bridge construction in use before riveting became common about 1900, was not only the speed of erection, but the ease with which a span could be knocked down, moved in small pieces, and as easily and quickly re-erected on a new site.

Mr. Mark W. Stevens has owned the Normanskill Farm for many years, and it appears on some maps and records as the "Stevens Farm."

Bearing only light vehicular traffic, this Whipple Bridge is one of the earliest examples of iron bridge building still in existence.

B. Biographical background:

1. Squire Whipple and the Whipple Design:

Whipple (1804-1888) was a prominent civil engineer who in 1847 published the first work in America describing the theory of stresses in bridge trusses. It was widely distributed and reprinted, having a far reaching effect in establishing scientific bridge design in this country. He has been rightly called "the father of iron bridges in America."

Squire (his given name, not title) Whipple was born in Hardwick, Massachusetts and came with his family to live in New York State at thirteen. A farm boy, he was self-educated in an amazing number of subjects, including Greek and astronomy. He studied as well at Fairfield Academy and he was graduated from Union College in 1830 after only one year there. His early experiences also included teaching and surveying.

Whipple's early engineering work was with the first American railroads and the New York State canal system. When plans were being readied in 1840 to enlarge the Erie Canal, Whipple realized that hundreds of new bridges would be necessary to span the widened waterway. He managed to save \$1,000 with which he constructed his first iron bowstring bridge, over the canal at Utica, New York. It was the first of hundreds that in the next thirty years would find acceptance all over the northeastern United States.

The inventor-engineer duly patented the design and details of his bridge in 1841, and thereafter tried in vain to stem the appearance and use of truss spans similar to his own. Other builders managed to incorporate "improvements" and "refinements" just sufficient to contest paying the originator any royalties on his patent. Even the State of New York formally adopted "Whipple's Patent Iron Arch Truss Bridge" as standard for its canals, but decreed that the bridges were to be erected "for the public good," thus evading royalty payments. In a rare outburst of righteous indignation Squire Whipple penned a wry comment in Latin

which roughly translates as: "These little bridges I invented, rats get the pay!"

Despite injustice, Whipple proceeded to write a small book entitled: "A Work on Bridge Building," which he published himself in 1847. Through it, the obscure New York State inventor has been recognized as the first man ever to analyze correctly and adequately the stresses in a bridge truss. His calculations were simple and precise and even employed short-cut processes that are logical and still useful. Although it took nearly thirty years for the contents of Whipple's book to be appreciated, bridge building itself gradually became accepted as a scientific profession rather than a trade.

From 1850 onward, Squire Whipple himself lived at 227 State Street in Albany, which is only two miles from the site of the Normanskill Farm bridge. He continued to invent new types of lift and draw bridges, and built spans similar to that at Normanskill Farm himself, as late as 1869. One bridge of this date still stands over Cayadutta Creek at Fonda, New York, these two being the only known survivors of the type. On his death in 1888, the inventor-engineer was buried in the Albany Rural Cemetery near Menands, New York.

Squire Whipple was issued U.S. Patent #2064 for his Iron Bowstring Truss on 24 April 1841. When this U.S. Patent expired after fourteen years, it was extended for another fourteen on 26 March 1855. Infringements on the patent, as noted above, were notorious. The patient but frustrated inventor gave up trying to collect royalties long before the patent finally expired. Considering the design well within the public domain, or perhaps even ignorant of infringement, many companies and individuals fabricated and erected Whipple-type iron bowstring truss bridges during the 1860-90 period. Among them was Simon DeGraff of Syracuse, New York, whose name and address is cast into some of the truss members of the Whipple Bridge at the Normanskill Farm.

2. Simon DeGraff:

Simon DeGraff (also in directories as "Harmon" and "Samuel") lived at 35 East Onondaga Street in Syracuse, and apparently maintained a works there as well. First appearing in 1851 listings for Syracuse, he is noted as a "contractor" from 1857 to 1865, and as a "Bridge Contractor" during 1866-67.

DeGraff was evidently a small local contractor who gradually came to specialize in bridge work. It is probable that the castings of the Normanskill bridge were cast to his order in a Syracuse foundry, quite likely that of George Draper with who DeGraff was soon to form a partnership. DeGraff's work appears to have been principally that of contractor and erector of bridges.

By 1869 Simon DeGraff, "Bridge Builder" is listed at a new location, 107 West Onondaga Street. For two years (1869-1870) he is also found as a partner with George Draper in Draper & Co., James St., at the corner of Pearl. This firm advertised: "Iron bridges, iron fence, railing, balconies, stairs, doors, grates, and general forging."

For another year DeGraff appears on his own as a "contractor" once more, and then as a householder still at 107 West Onondaga Street. The last listing for this builder of Whipple Truss Bridges is 1873.

C. Conjecture:

The Whipple bridge at Normanskill Farm is likely to have been built for a site nearer Syracuse, perhaps over the Erie Canal or one of its branches. While still serviceable it was superseded by a larger span of greater strength, and disposed of to another town or municipality. Moving and re-erection of such bridges was common practice by the various New York State-based iron bridge companies of the 1880's. If this occurred, the present site of the bridge may be its third.

D. Sources of Information:

1. Bibliography:

American Society of Civil Engineers. Transactions 21 (1889): 14-15, 19-20.

Boyd's Syracuse Directory (ies). Syracuse: Sampson and Murdock Co., Inc., 1851-1875.

Howell, George Rodgers. Bi-centennial History of Albany: History of the County of Albany, N.Y., from 1609 to 1886. New York: W.W. Munsell & Co., 1886.

Sayre, Mortimer F.; Hardesty, Shortridge; and Jansen, Carl B. "Squire Whipple, Class of 1830." Union Worthies 4 (1949). Schenectady: Union College.

Whipple, Squire. A Work on Bridge Building Consisting of . . . Original Plans and Practical Details for Iron and Wooden Bridges. Utica: H.H. Curtiss, 1847.

\_\_\_\_\_ . The Canal Bridge . . . etc. 1852.

2. Official Records:

Maps and Records on file at Albany County Clerk's Office,  
Albany, New York.

United States Patent Office Records, Washington, D.C.

Prepared by Richard S. Allen  
Historian  
September 1969

PART II. ENGINEERING INFORMATION

A. General Statement:

1. Structural character: A Whipple bowstring truss vehicular bridge fabricated of cast and wrought iron and originally used at another site.
2. Condition of fabric: Excellent. The bridge has been well maintained by its owner.

B. Description:

1. Over-all dimensions: The span is 109' 10" in length and 22' 9" wide.
2. Shape: Polygonal "bowstring" truss divided into nine panels.
3. Foundations: The end abutments are of stone and concrete. The stone is laid in random ashlar pattern; the concrete is presumably not reinforced.
4. In each truss the top chord ("bowstring," or "arch") is formed of nine tangential castings of inverted U cross section. The lower chord, at deck level, is formed of two lines of 9 wrought-iron open links, made from 1 1/2" square-bars. The four center vertical web members are inverted V's of two 5/8" bars, welded together at the top, the threaded lower ends inserted into holes in the floor beams. The four end verticals are single 2" rods. Web diagonals are double in each panel, of 7/8" rod. The cast floor beams are trussed with two 7/8" rods, strutted at the center and approximately the quarter points.

19.

All tensile connections are threaded except for the lower chords, where the links simply bear upon cast-iron joint blocks. The end links, however, are open-ended, upset to round section and threaded, and bear on the top-chord ends by nuts to provide a limited adjustment.

Prepared by Richard J. Pollak  
Professor of Architecture  
Ball State University  
5 August 1969

Additional notes by Robert M. Vogel  
Curator of Mechanical &  
Civil Engineering  
Smithsonian Institution  
August 1970

TECHNICAL ADDENDUM

NEW YORK STATE CANALS

1871



SPECIFICATION

Of the Manner of Constructing Whipple's Patent Iron Arch  
Truss Bridge Superstructures,

For-----  
-----

Each Superstructure to consist of a plank and timber flooring, supported by two or more trusses of wrought and cast iron, and, in cases of bridges with sidewalks, an iron railing three feet high on the outside of each sidewalk.

The trusses to be composed of cast iron arches and connecting blocks, and wrought iron chords, uprights and diagonals; and the flooring of iron needle beams, pine joists and oak planking, as shown on the plans exhibited at the letting.

The truss arches to consist of straight pieces, diverging and widening horizontally, from a width of about 1/12 the length of the piece, in the middle, to about 1/4 the height of the truss (and rather more in short trusses) at the end of the arch, each widening in proportion as it pitches downward from a horizontal position. In trusses from 55 to 75 feet in length, the arch is to contain 7 pieces, meeting at angles of 82 degrees, the ends being beveled 4 degrees, so as to form a joint, with a



19.

deflection of 8 degrees from one piece to the next contiguous. In trusses from 75 to 100 feet in length, the arch is to contain 9 pieces, with ends beveled 3 degrees at the joints, giving 6 degrees angle of deflection from piece to piece, or such other angle of deflection as may be directed by the Resident Engineer in charge of the work.

The extremities of the arch are to be formed into feet resting on the abutments with a flat bearing of 11 to 13 inches from heel to toe, and have a firm connection with the ends of the chords by having the endmost links left open at the connection, and after passing through the feet from heel to toe, secured by screw nuts at the toe; in which case, the portion of the rod where the screw thread is cut, is to have at least  $3/8$  inch greater diameter than the rest of the chord.

The ends of the arch castings at the joints are to be so shaped as to form vertical holes for the uprights to pass through, and afford horizontal bearings for the nuts of the uprights on the upper, and for the eyes of the diagonals on the under side, the holes being so placed that the plane of the arch joint may cut the center of the uprights about two inches below the upper side of the castings.

The depth or width of arch castings (towards the center of the general curvature) is to be not less than  $1/18$  the length of the pieces respectively, unless a compensating increase be made in the cross sections of the pieces; which cross sections, multiplied by the natural sine of the inclination of the pieces respectively from the vertical, are in all places to give products of not less than one square inch for each 90 square feet of bridge floor supported by the trusses respectively, not including the coping under the trusses and railing; and in trusses supporting less than 10 feet width of flooring each, the cross sections of the arch castings, multiplied as above stated, are to give products of not less than one square inch to every 70 square feet of flooring, and to have not less than half an inch in thickness of iron in any part, and not less than  $7/8$  inch in thickness within 3 inches of the joints.

No wedging of the arch joints will be allowed. The ends of the pieces must be planed by machinery, or accurately hand-dressed, as may be directed by said Engineer.

Near the outer or upper corner of the joints are to be projections of about  $3/4$  of an inch in length and depth and  $1\ 1/2$  to 2 inches in width, cast on one piece, and extending into the angles of the contiguous piece, to assist in keeping the ends in place.

Each piece of the arch casting is to have at least 4 cross bars connecting the side portions; the end ones being 5 to 6 inches

wide, and of a depth, at the upright hole, not less than  $\frac{1}{5}$  the width of castings at the point of location; the others at uniform distances between the former, and in section equal to  $\frac{1}{3}$  that of the longitudinal parts of the castings.

For the forms and proportions of the cross-bars, and for other particulars not here specified, as well as for the better understanding of these specifications generally, reference is had to the drawings, and to instructions and directions of the Engineer in charge of the work.

The connecting blocks are to be of cast iron; the end portions, where the links go on, to be about  $2\frac{1}{2}$  inches deep, with a cross section nowhere less than  $2\frac{1}{2}$  times the cross section multiplied by the diameter of the iron in the chords, and divided by the width of the connecting block. The edges of the blocks to be fitted to the semi-circular ends of the links.

The central portion of the block is to be so enlarged as to admit of the holes for the uprights and diagonals, and not allow of being cut or fractured in that part without an area of section or fracture at least 20 per cent greater than the cross section of the block where it receives the links of the chords.

The lengths of connecting blocks are to be, for those next the ends of the truss, such that the endmost links of the chord may run parallel from their connections with the feet of the arch, and connect on the ends of the block, the next succeeding links being inside of the former, and so on to the middle of the truss, with the two links of each pair parallel, or nearly so, and the blocks diminishing in length successively by about twice the diameter of the iron in the links.

All the iron to be of such kinds, mixtures and qualities as to produce sound and strong castings, equal to the best descriptions of metal used for machinery.

The ends of the chords and the feet of the arches on the abutments are to be covered with a cast iron box to protect them from contact with the earth of the approach.

#### WROUGHT IRON WORK

The chords to each arch piece are to be composed of two links of such lengths as to be joined in pairs by the cast iron connecting blocks directly under the arch joints, and connected with the extremities of the arch in the manner before described. The aggregate cross section of the chord to each truss is to contain not less than one square inch for each 120 square feet of bridge flooring (copings not included) sustained by the truss.

The uprights are to be one at each joint of the arch; the middle ones (and more when required) in each truss, to be composed of two rods united into one at the upper end, for that portion which passes through the eyes of the diagonals, the arch, and the nut on the top; with a collar or ring  $7/8$  inch square iron welded on just below the eyes of the diagonals, to prevent the latter from sliding down. From 2 to 3 inches below the collar, the two rods diverge at an angle of 10 to 12 degrees, and pass through the connecting blocks outside of the chords. The upper end, or single portion in these uprights, is to be of the same diameter as in the single uprights of the same trusses, and the double portion of  $1\ 5/8$  inch iron for sidewalk bridges of spans over 75 feet, and of  $1\ 1/2$  inch iron for all other bridges of less than 100 feet span, unless otherwise directed.

Each branch of the double uprights is to have a nut to bear on the upper side of the iron needle beam, and another on the under side of the connecting block, the uprights passing through cast iron thimbles or washers, intervening between the bottom of the needle beam and connecting block, to afford a bearing for the beam.

The rest of the uprights are to be each formed of a single round bar or rod, with a collar and nut, as above described, at the upper end, and passing through the center of the connecting block, to be secured by a nut on the lower end, and to have an adjusting nut to bear on the top of the iron needle beam. The diameters of the single uprights to be not less than 2 inches for spans of 90 to 120 feet, and  $1\ 3/4$  inches for spans of 50 to 90 feet for single roadways without sidewalks. For double roadways and bridges with sidewalks, the size of both single and double uprights to be increased, as may be directed by said Engineer.

The diagonals are to be two, crossing each other in each of the quadrilateral panels of the truss, of  $1\ 1/8$  inch round iron in all sidewalk bridges of over 75 feet span, and of 1 inch iron for all other bridges, except when otherwise particularly specified. They are to be formed with a strong eye at the upper end for the upright, and bent near the eye, so that it may fit horizontally upon the collar of the upright, or upon the eye of the diagonal, connecting at the same point. Where the diagonals go on to the uprights, the one running downward towards the centre of the truss is to go on last, or above the other; and the bend at the eye is to be close to the outer edge of the collar, or of the other eye upon which it bears.

The lower end of the diagonal is to pass obliquely through the connecting block, with a screw nut at the end for adjustment, the screw being cut at least 8 inches from the end, and to have a diameter  $1/4$  inch larger than the rest of the rod.

The nuts on both uprights and diagonals to be hexagonal, and properly proportioned for the purposes intended.

There shall be a pair of diagonal sway rods in each panel of the bridge; those in the end panels to be  $7/8$ , and in the intermediate panels  $3/4$  inch round iron, and in bridges of 90 to 120 feet span, there shall be two pairs at each end, of  $7/8$  inch iron. The sway rods are to be connected with the single uprights of the trusses at the upper side of the connecting blocks by eyes through which the uprights shall pass, and in a similar manner to a horn cast on the upper side of the crotch rod saddles. The sway rods to have turn buckle adjustment near one end, the screwed portion being enlarged  $1/4$  inch.

At the ends of the bridge, the sway rods are to connect by eyes with the screws and nuts uniting the chord with the feet of the arches, or in any other convenient and substantial manner.

The sidewalk railing is to be of wrought iron, except the corner posts, and when not otherwise specified, is to consist of vertical posts of  $1\ 1/8$  inch square iron, once in 4 to 5 feet; a bottom rail of 1 inch square iron about 4 inches above the bottom of the posts; a top rail of  $1\ 3/4$  inch by  $1/2$  inch iron, flatwise on the top of the post, with a strip of 1 inch by  $1/4$  inch on the top of the last; and balusters of  $3/4$  inch square iron, once in 6 inches, doweled and riveted to and between the top and bottom rails. At the bottom of each post, and crosswise of the railing, is to be a foot piece, 6 to 7 inches long,  $2\ 1/2$  inches wide, and half an inch thick, firmly riveted to the bottom of the post, and having two holes, one on each side of the post, and about  $3\ 1/2$  to 4 inches from center to center, for bolting down to the wood work with  $5/8$  inch bolts. On the outside of the railing, the foot plate is to be welded to the lower end of a scroll or ogee brace of  $3/4$  inch square iron, running up, and riveted to the post about midway of its length.

The posts at the ends of the railing, or at the corners of the bridge, are to be of hollow cast iron, 3 to 4 inches in diameter, and of any neat and comely pattern approved by the Engineer.

The wrought iron work is to be made of the best qualities of American rolled iron, for all parts except sidewalk railings, which may be made of good common English bar iron.

NEEDLE BEAMS

19.

The trusses are to be connected by cross girders (or needle beams) of wrought iron, one at each upright, and resting upon the eyes of the sway rods at the single uprights, and on cast iron thimbles or washers at the double ones. The cross girders to consist of a vertical web plate  $1/4$  of an inch in thickness, with top and bottom flanges each of two angle irons, riveted on with  $3/4$  inch rivets having 4 inch pitch; the beam to have suitable holes for uprights, and be of such depth, length and form as shall be shown upon the drawings exhibited for letting, or as may be directed by the said Engineer. When required, solid wrought iron beams to be inserted in lieu of vertical web plate beams, and to be so proportioned as to give the requisite cross sections for the variable spans proposed.

FLOORING

The joists are to be of good pine timber, with a depth equal to about  $1/12$  of their length between bearings; placed not over 28 inches apart from center to center, nor more than 6 inches from the ends of the plank (or more than 4 inches in case of sidewalk plank), and to have an aggregate thickness in carriage-ways not less than 17, and in sidewalks  $1/8$  the length of plank or width of flooring supported.

When not otherwise specified, the carriage-ways are to be planked with  $2\ 1/2$  inch oak, spiked crosswise upon the joists, with 6 inch cut or wrought spikes, having a cross section not less than one inch to each 5 square feet of plank. Sidewalks to be planked with 2 inch pine plank, spiked with 5 inch spike or nails.

Under each arch truss, just above the flooring, is to be a coping of 2 inch pine plank, not less than 2 feet wide, consisting of 2 strings of plank, one on each side of the uprights and diagonals, and fitted about them so as to bring their edges together at the center of the truss, the outer edges coming just over the ends of the floor plank, and being supported by the cross pieces between the joists on either side of the truss.

In bridges without sidewalks, the outer coping to be 15 inches wide, with a fascia plank of a proper depth, and  $1\ 1/2$  inches in thickness under the coping, placed  $2\ 1/2$  inches from the outer edge.

On the outside of sidewalks is to be a stringer, 9 or 10 inches deep and 6 inches thick, with its upper side about  $1/2$  inch above the sidewalk plank, and surmounted by a coping 3 by 10 inches, beveled about 2 inches by  $1/2$  inch on the upper corners, with grooves  $3/8$  inch wide and  $5/16$  deep on the under side, about  $1/2$  inch from each edge.

Upon this coping, near the center, the railing is to be secured by two 5/8 bolts to each post, passing through coping and stringer, and through the ends of needle beams when practicable. But when this is not convenient, the stringer may be first bolted firmly to the ends of the beams, and the railing bolted only to the stringer and coping. Bolt heads and nuts are in no case to act against wood without suitable iron washers.

All the coping, facing plank and rail stringers to be of good pine timber, planed on the upper and outer surfaces and edges, and painted with at least two good coats of white lead or zinc paint and linseed oil.

All parts of the iron work which are accessible after the work is put together, are to be painted with two good coats of lampblack and boiled linseed oil, or other paints approved by the Engineer in charge, except the under sides of the arch castings, which may be painted only one good coat. Those parts of the trusses not accessible for painting after being put together, are to be thoroughly painted at least one good coat before putting together.

The preceding specifications are intended to be applicable to all bridges upon the general plans here referred to, whether with two or a greater number of trusses.

In all cases, not otherwise specified, trusses are to be placed 19 feet apart between centers; and the center of sidewalk railing, when used, 6 feet from center of truss.

For a more full and perfect explanation of the form and dimensions of all the work, and of the manner of executing it in all its details, plans and bills of timber will be furnished by the said Engineer, who will also give such directions during the progress of the work as may appear to him necessary to have the same done in every respect complete and perfect, on the plan contemplated in the foregoing specifications; and the said directions shall in every respect be complied with.

(Transcribed from document in Horatio Seymour collection of scrapbooks on New York canals, 1878-1882, vol. 1, p. 40. Manuscript and History Division, New York State Library, Albany, New York.)

PART III. PROJECT INFORMATION

These records were prepared as part of the Mohawk-Hudson Area Survey, a pilot study for the Historic American Engineering Record which was established in 1969 under the aegis of the Historic American Buildings Survey. The Project was sponsored jointly by the National Park Service (Historic American Buildings Survey), the Smithsonian Institution (National Museum of History and Technology), the American Society of Civil Engineers (National Headquarters and Mohawk-Hudson Section), and the New York State Historic Trust. The field work and historical research were conducted under the general direction of Robert M. Vogel, Curator of Mechanical and Civil Engineering, Smithsonian Institution; James C. Massey, Chief, Historic American Buildings Survey; and Richard J. Pollak, Professor of Architecture, Ball State University, Project Supervisor; and with the cooperation of the Department of Architecture, Rensselaer Polytechnic Institute.